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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/537,856	06/07/2005	Martin S. Wilcox	GB02 0217 US	7210

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EXAMINER	
CHEN, SHELLEY	
ART UNIT	**PAPER NUMBER**
3662	

DATE MAILED: 12/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/537,856	WILCOX, MARTIN S.	
	Examiner	Art Unit	
	Shelley Chen	3662	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 June 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 June 2005* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *07 June 2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

2. The drawings are objected to because the unlabeled rectangular box(es) should be provided with descriptive text labels. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are

not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Method and Apparatus for Measuring Distance Using Dual-Component Radar.

4. The disclosure is objected to because of the following informalities: Section headings are missing from the specification.

Appropriate correction is required.

Claim Rejections - 35 USC § 101

5. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6. **Claims 1-4 rejected** under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The claimed inventions manipulate information but do not produce a tangible result.

Claims 1-4 are processes that include the judicial exception of an abstract idea (determining distance). No physical transformation is present to establish a practical application of the idea. The result (calculated distance) is useful only if it is at least made available for use in the disclosed practical application, concrete if the determination is based on objective criteria, and tangible if it is more than just a thought or a computation within a processor, instead being a real world result.

In this instance, claims 1-4 do not appear to produce a tangible result such that the usefulness of the determination can be realized. It, therefore, appears to be non-statutory.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.

3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. **Claims 1-14 rejected** under 35 U.S.C. 103(a) as being unpatentable over **Fuchter et al.** (U.S. Patent # 5,796,364) in view of **Low et al.** (U.S. Patent 3,659,292).

Regarding claims 1, 3, 5, 7, 9-10, and 12, Fuchter clearly shows and discloses the claimed invention except that his invention transmits the first and second codes sequentially instead of simultaneously. Fuchter discloses a radar system that determines range (column 1 lines 31-47) by transmitting and receiving two periodic codes of unequal duration (column 1 lines 12-17, column 2 lines 9-14), as shown in the figure. A receiver detects the codes and generates a distance measurement for each code, which are then combined into a third distance calculation (column 1 lines 59-64) if the individual distance measurements are reasonably close (column 6 lines 46-59, discusses velocity but also applies to distance).

In the same field of endeavor, Low discloses another sequential radar ranging system that compares a series of code transmissions to determine distance. However, Low discloses that simultaneous code sequence transmission is common in the prior art (column 2 lines 36-41), but ultimately chooses to use sequential transmission to reduce signal degradation due to power sharing over long distances (such as between a ground station and an extraterrestrial probe, see abstract). The signal degradation would not be so serious over the (likely) shorter distances of Fuchter's ranging system. See also the abstract (basics), column 2 lines 3-5 (relatively prime code periods in prior

art), column 3 lines 11-24 (more basics), and table 3 (18 possible code components and resulting range ambiguity resolving power). Thus Low teaches all of the additional limitations introduced by claims 1, 3, 5, 7, 9-10, and 12.

Therefore, it would have been obvious to one skilled in the art at the time of the invention to modify Fuchter's ranging system to transmit the code sequences simultaneously, as taught by Low and many others.

Doing so would decrease the time required to make a range measurement, thus allowing more frequent range updates. This is especially useful for close-range or fast-moving targets.

Regarding claim 2 as applied to claim 1 above, **claim 6** as applied to claim 5 above, **claim 11** as applied to claim 10 above, **and claim 13** as applied to claim 12 above, Fuchter further discloses that the respective durations of the first and second codes are proportional to respective numbers having a relative prime relationship, as discussed in column 7 lines 20-24. (See figure and column 2 lines 27-33 for background). See also Low column 2 lines 3-5 (relatively prime code periods in prior art).

Regarding claim 4 as applied to claim 1 above **and claim 8** as applied to claim 5 above, Fuchter fails to disclose any information about the time of flight of the signals. However, Low discloses that at least one of the first and second indications of distance is an indication of time of flight of the signal, as discussed in column 9 lines 50-64, "...A

round-trip time-of-flight estimate for the transmitted signals is also required [as a computer input to calculate range] ". Thus Low teaches all of the additional limitations introduced by claims 4 and 8.

Therefore, it would have been obvious to one skilled in the art at the time of the invention to modify Fuchter's ranging system so that at least one of the first and second indications of distance is an indication of time of flight of the signal, as taught by Low.

Doing so would permit easy calculation of the distance by use of the relationship between the distance and the time of flight and velocity of the signals.

10. **Claim 14 rejected** under 35 U.S.C. 103(a) as being unpatentable over **Fuchter et al.** (U.S. Patent # 5,796,364) in view of **Low et al.** (U.S. Patent 3,659,292) as applied to claim 12 above, and further in view of **Richards et al.** (U.S. Patent # 6,295,019).

Regarding claim 14 as applied to claim 12 above, Fuchter's invention, as modified by Low, clearly shows and discloses all of the limitations of the instant invention except that their ranging system does not multiply the first and second code components by an in-phase and quadrature oscillator signal, and then sum the resulting products during the generation/transmission step. However, this is a common method (quadrature phase shift keying) to simultaneously transmit two binary signals.

In one embodiment of Low's invention, a returned code sequence and a reference code sequence are received simultaneously at a ranging receiver (46 on

figures 1 and 3) as shown in figures 3 and 5. The first and second block of figure 5 show a case where the codes were modulated onto in-phase and quadrature signals as in the instant claim. See also column 6 lines 15-29 (ranging receiver code inputs are 90 degrees out of phase) and column 11 lines 33-37 (output on in-phase and quadrature leads).

Low also discloses that the transmitter (10) modulates the phase of an oscillator by the code sequence using the transmitter coder (20) and phase modulator (24) of figure 1 and that "Any conventional form of modulation can be used" (See column 4 lines 56-66). Thus Low teaches all of the additional limitations introduced by claim 14.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Fuchter's invention to transmit the two pulse codes under quadrature phase shift key modulation rather than directly as a pulse train, as taught by Low.

Doing so would permit the two binary signals to be transmitted simultaneously without loss of information due to interference.

See also Richards et al. (U.S Patent # 6,295,019) regarding claims 3-4, 7-8, and 14, particularly the abstract.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references are cited as disclosing limitations of the applicant's claimed and disclosed inventions: Attwood, Ganz, Rittenbach, Miller, Maitre, Andrews, Deadman, Knepper, and Burkhardt.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shelley Chen whose telephone number is (571) 270-1330. The examiner can normally be reached Mondays through Thursdays and on alternate Fridays, between 9:00 AM and 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrell McKinnon can be reached at (571) 272-4797. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Shelley Chen,

Patent Examiner

Art Unit 3662

December 7, 2006

TERRELL L. MCKINNON
SUPERVISORY PATENT EXAMINER